the screw of the mandril; then take out the steel slider, enlarge the hole in the axis of the chuck, so as to receive easily the thickest wire that is wanted to be turned: lastly, divide the steel slider by a transverse cut into two equal parts or jaws, and angle them out so that they shall hold firmly whatever work may be put between them.

No. X.

DOUBLE DRIVER FOR A LATHE.

The LARGE SILVER MEDAL *of the Society was this Session presented to Mr.* JOS. CLEMENT, 19, *Prospect Place, St. George's, Southwark, for a Self-acting Double Driver for a Lathe Chuck; a Drawing of which is in the Society's Repository.*

21, *Prospect Place, St. George's, Southwark,*
SIR, *April* 30, 1829.

THROUGH your kindness I beg to return my thanks to the Society of Arts, &c. for the several honorary rewards they have been pleased to confer upon me, viz. for my elliptical machine, drawing-table, and turning-lathe.

As it has always been the wish of the Society to encourage the invention of new machinery that is likely to be beneficial to the public, as well as the improvement of such as is already in use, I flatter myself that they will allow me the honour of laying before them a new self-adjusting double-driving centre chuck of a turning-lathe.

The turning-lathe is the most common machine or tool that is at present in use, and perhaps of the greatest importance to the public; for, upon the turning-lathe, in a great measure, depends the correctness of all other machinery. Although I have been in the habit of turning and making turning-lathes and other machinery for upwards of thirty-five years, and have also examined the best turning-lathes in the principal manufactories throughout Great Britain, I find it universally regretted by all practical men that they cannot turn any thing perfectly true between the centres of the lathe.

I have known the cause of this variation for a great number of years, yet I have never been able to accomplish any thing satisfactory for its correction till within these last two years. The variation proceeds from the driver, which acts only on one end of the carrier, together with the resistance of the tool; for although a thing be adjusted between the centres of the lathe so as to have no shake previous to turning, yet, when the tool is applied, it causes the thing to bend or spring from the tool more or less according to the depth of the cut, and the length and strength of the article to be turned; consequently, being bent, its two ends will be brought nearer together, and one or both of them will be pressed towards one side, so as to be eccentric with regard to the centres of the lathe. The error, however, is the greatest at the end to which the driver is applied, and this proceeds from the driver acting only on one end of the carrier, which also tends to press that end towards one side of the centre, and to retain it in that position as long as the resistance of the tool is applied to it. As a proof of the above statement, only fix the carrier on the opposite side of the thing that has been turned, and turn a piece adjoining that

which had been previously turned, and it will be readily perceived that the two parts are eccentric to each other. I have long been convinced, that if two drivers could be applied so as to act with equal force, the error above stated would be overcome.

I have thought of a great many ways to accomplish the object, but all of them were either very complex or required some adjustment to be made by the hand of the operator, except the one which I now ask the favour of submitting to the notice of the Society.

I am, Sir, &c. &c.

A. AIKIN, Esq.
Secretary, &c. &c.

JOSEPH CLEMENT.

Reference to the Engraving. Plate X.

Fig. 1 is a side or edge view of the chuck; fig. 2 is a face or front view; and fig. 3 is a horizontal section of figs. 1 and 2. The same letters refer to the same part in each view.

a a is a circular plate or chuck, on the back of which is formed a boss *b:* the boss *b* contains a female screw for screwing it on the nose of the lathe-mandril. On the face of the chuck or plate *a a,* and in the middle, is screwed a conical centre *c,* on which is supported one end of the thing to be turned, as shewn at *d* in fig. 1. *e e* is a parallel plate in the form of a cross, one side of which is fitted to the face of the chuck *a a;* in the middle of the horizontal arms of the plate *e e* are two oblong holes *f f,* as represented by the dotted lines in fig. 2, and also shewn in fig. 3; *g g* are two screws which pass through the holes *f f,* and screw into the face of the chuck *a a;* the necks of the screws *g g* are made to fit the holes *f f*

in one direction, but the plate *e e* is at liberty to slide to and fro beneath the heads of the screws *g g* in the contrary direction: there is also a thin washer beneath the heads of the screws *g g*, which acts as springs, and tends to hold the plate *e e* in the situation wherever it may be slid to; there is also an oblong hole in the middle of the plate *e e*, through which projects the centre *c*: in the vertical arms of the cross or plate *e e* are six screwed holes; *h* and *i* are two studs or drivers, which may be screwed into any of the holes marked *j*, so as to accommodate the length of the ends of the carrier *k*. The carrier must be formed with two ends, as represented in figs. 1 and 4, (or the carrier may be constructed as shewn in fig. 5). There is also a face view of the carrier *k*, represented in its place (by dotted lines on the face of the plate *e e*, fig. 2). The ends of the carrier are acting against the studs *h* and *i*.

Supposing a piece of metal *a*, to be supported between the centre *c* of the chuck *a a* and the centre of the poppet-head of the lathe, and the carrier *k* to be fixed on one end of it, as shewn in fig. 1: let the plate *e e* (see fig. 2) be slid on the face of the chuck *a a*, a little towards the left hand; then the stud *h* would cause the upper end of the carrier *k* to move or turn in the same direction upon the centre *c*. But the stud *i*, and the lower end of the carrier *k*, will be moved in contrary directions, and will be separated from each other double the distance that the plate *e e* has slid on the face of the chuck *a a*; therefore, should the plate *e e* be in the above position, and the lathe put in motion in the direction of the arrow, the stud or driver *h* would be the first that would come in contact with the carrier *k*. But when the turning-tool is applied to the thing to be turned, or any resistance which tends to

prevent it from turning round, the carrier *k* will cause the upper stud *h* and the plate *ee*, together with the stud *i*, to be slid towards the left hand till the stud *i* comes in contact with the lower end of the carrier *k*; then the studs or drivers *h* and *i* will be acting with equal force against the ends of the carrier *k*, which will remove the greatest part of the twist or strain from the centre *c* of the chuck *aa*, by which means any slender cylinder, &c. may be turned more perfectly than can be done by a single driver. If another stud be screwed into one of the holes opposite the drivers *h* or *i*, it will prevent the thing to be turned from over-running itself, or backlashing when it has got a heavy side. The drivers *h* and *i* may be made of different lengths, as may be found most convenient.

No. XI.

TAPS FOR SCREW-NUTS.

The Thanks of the Society were voted to Mr. JAMES JONES, *of Well Street, Wellclose Square, for his Communication respecting an Improvement made by him in tapping large Screw-Nuts; and the same was ordered to be printed in the Society's Transactions.*

Well Street, Wellclose Square,
March 10, 1829.

SIR,

I BEG leave to submit to the Society of Arts, &c. an alteration in the construction of screw-taps, which,